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*SKN*

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/843,124    04/25/97    KAWASE

T    3442

IM62/0528

W G FASSE  
INDIAN POND LANE  
P O BOX K  
ST ALBANS ME 04971

EXAMINER

KUNEMUND, R

ART UNIT

PAPER NUMBER

1765

DATE MAILED:

05/28/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

08/843,124

Applicant(s)

Kawase et al

Examiner

Robert Kunemund

Group Art Unit

1765

☒ Responsive to communication(s) filed on Mar 15, 1999

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-25 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-5 and 8-25 is/are rejected.

☒ Claim(s) 6 and 7 is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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The Rejections

*The following is a quotation of the first paragraph of 35 U.S.C. 112:*

*The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.*

Claims 24 and 25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims contain subject matter not found in the originally filed specification.. The specification does not state any reaction between the water in the boric oxide and the carbon and then reversing such reaction as instantly claimed. Further, there is no support for the water amount to be less than 300 ppm.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to

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the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 3, 19, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bourret-Courchesne in view of Yamamoto.

The Bourret-Courchesne reference teaches a growth of gallium arsenide from a melt. In a crucible of quartz a charge is placed. The charge is solid polycrystalline GaAs with boric oxide. The crucible is then heated to cause melting. Due to the properties of the boric oxide, it melts first and stays on top of the melt, while the remaining solid is melted. Once, the melt is formed the single crystal can be formed by seed pulling or bridgeman techniques, note entire reference. The sole difference between the instant claims and the prior art is the addition of a dopant. However, the Yamamoto reference teaches that carbon is a dopant for GaAs and is added to the original charge in solid form prior to any melting. It would have been obvious to one of ordinary skill in the art to modify the Bourret-Courchesne process by the teachings of the Yamamoto reference to add carbon as a dopant in order to produce the desired E12 characteristics.

Claims 4, 5, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bourret-Courchesne in view of Yamamoto and Yamashita.

The Bourret-Courchesne and Yamamoto reference are relied on for the same reasons as stated, supra, and differ from the instant claims in the addition of water to the boric oxide.

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However, the Yamashita reference teaches that when growing gallium arsenide from a melt, the addition of water to boric oxide. It would have been obvious to one of ordinary skill to modify the Bourret-Courchesne process by the Yamashita reference to add water to the boric oxide in order to control the carbon concentrations in the melt.

Claims 8 to 18, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bourret-Courchesne in view of Yamamoto and Yamashita.

The Bourret-Courchesne, Yamashita and Yamamoto reference are relied on for the same reasons as stated, supra, and differ from the instant claims in the type of carbon and melt times. However, in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to determine through routine experimentation the optimum, operable type of carbon source and melt times in the prior art in order to uniformly dope the melt and allow the melt to achieve a uniform consistence.

1. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Response to Applicants' Arguments*

Applicant's arguments filed March 15, 1999 have been fully considered but they are not persuasive.

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Applicants' argument concerning the reaction between the water and the carbon is noted. However, there is no support in the originally filed specification for the process being argued by applicants. In fact, claim 1 does not require the use of any water in the boric oxide.

Applicants' argument concerning the rejections of claims 1 to 3, 19, 20 and 21 has been fully considered and not deemed persuasive. The Bourret-Courchesne reference teaches the addition of water to wet the crucible along with impurity removal. The impurities removed are all from the crucible. The reference does not state anywhere that the GaAs cannot be doped. A dopant cannot be considered an impurity since a dopant is purposely added to the melt. Further, the instant specification teaches the use of water to remove impurities. The Yamamoto reference teaches the use of carbon as a dopant not an impurity to obtain an electrical property. Therefore, the combination of references is well within the skill of the art and obvious so as to grow crystals of desired properties.

Applicants' argument concerning the starting materials is noted. However, it has not been shown that the Yamamoto reference solely teaches elemental addition. The combination of references does in fact teach that compound semiconductor is a starting material, and carbon is added to this material. Thus, the boric oxide melts first and contacts the remaining materials.

Applicants' argument concerning the rejection of claims 4 and 5 has been considered and not deemed persuasive. The Yamashita reference is relied on to show the claimed water content. The reference is solely relied on for this teaching and modifies the water content in the Bourret-Courchesne reference.

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Applicants argument concerning claims 8 to 18, 22 and 23 is noted. However, applicants have not shown that the limitations set forth create unexpected results or are not within the skill of the art. Hence, the claims are merely optimumizations of art recognized result effective variables.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

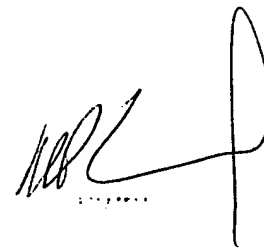
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Kunemund whose telephone number is (703) 308-1091. The examiner can normally be reached on Monday through Friday from 7:00 to 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ben Utech, can be reached on (703) 308-3324. The fax phone number for this Group is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

RMK

May 25, 1999

A handwritten signature in black ink, appearing to be 'RK' followed by a stylized flourish.

ROBERT KUNEMUND  
PRIMARY PATENT EXAMINER  
A.U. #1765